



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2017-1237; Product Identifier 2017-NE-43-AD; Amendment 39-19333; AD 2018-15-01]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce plc Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule; request for comments.

SUMMARY: We are adopting a new airworthiness directive (AD) for certain Rolls-Royce plc (RR) Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H, Trent 1000-A2 Trent 1000-C2, Trent 1000-D2, Trent 1000-E2, Trent 1000-G2, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2, and Trent 1000-L2 engine models. This AD requires certain engines susceptible to intermediate-pressure turbine (IPT) blade failure not be installed on an airplane together with other engines with IPT blades of the same age. This AD was prompted by new operating restrictions for engines with IPT blades susceptible to shank corrosion and possible blade separation. We are issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of [INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

We must receive comments on this AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12 140, 1200 New Jersey Avenue SE., Washington, DC 20590.
- Hand Delivery: U.S. Department of Transportation, Docket Operations, M 30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this final rule, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, England, DE24 8BJ; phone: 011-44-1332-242424; fax: 011-44-1332-249936; email: http://www.rolls-royce.com/contact/civil_team.jsp; Internet: <https://customers.rolls-royce.com/public/rollsroycecare>. You may view this service information at the FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7759. It is also available on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2017-1237.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2017-1237; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the mandatory continuing airworthiness

information (MCAI), the regulatory evaluation, any comments received, and other information. The address for the Docket Operations (phone: 800-647-5527) is listed above. Comments will be available in the AD docket shortly after receipt.

FOR FURTHER INFORMATION CONTACT: Kevin M. Clark, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7088; fax: 781-238-7199; email: kevin.m.clark@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

The European Aviation Safety Agency (EASA), which is the Technical Agent for the Member States of the European Community, has issued EASA AD 2018-0086, dated April 17, 2018 (referred to hereinafter as “the MCAI”), to correct an unsafe condition for the specified products. The MCAI states:

An occurrence was reported where, following N2 vibration and multiple messages, the flight crew performed an engine in-flight shut-down (IFSD) and returned to the departure airport, landing uneventfully. The post-flight borescope inspection of the engine revealed an intermediate pressure turbine blade (IPTB) missing at the shank. Analysis shows that this kind of failure is due to sulphidation corrosion cracking.

This condition, if not detected and corrected, could lead to IPTB shank release, possibly resulting in an IFSD and consequent reduced control of the aeroplane.

To address this potential unsafe condition, RR issued Alert NMSB Trent 1000 72-AJ575 to provide instructions for engine removal from service when any IPTB with a high level of sulphidation exposure is identified by corrosion fatigue life (CFL) model. Consequently, EASA issued AD 2017-0056 to require removal from service of certain engines, to be corrected in shop.

Since that AD was issued, prompted by further occurrences and analyses, it has been decided that, to reduce the risk of dual IFSD, a new cyclic life limit must be applied to certain engines, which determines when an engine can no longer be installed on an aeroplane in combination with certain other engines. RR published

the original issue of the NMSB to provide de-pairing instructions, including the relevant IPTB cyclic limit for each engine. Consequently, EASA issued Emergency AD 2017-0253-E to require de-pairing of the affected engines.

Since that AD was issued, RR issued Revision 2 of the NMSB, which removes and adds certain ESN from the list of affected engines and introduces another IPTB cyclic limit.

For the reason described above, this [EASA] AD retains the requirements of EASA AD 2017-0253-E, which is superseded, amends the Applicability, and requires application of the new limit.

You may obtain further information by examining the MCAI in the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2017-1237.

Related Service Information under 1 CFR Part 51

We reviewed RR Alert Non-Modification Service Bulletin (NMSB) Trent 1000-72-AJ992, Revision 1, dated January 3, 2018, and Revision 2, dated April 16, 2018; and RR Service Bulletin (SB) Trent 1000 72-H818, dated November 14, 2016. Alert NMSB Trent 1000-72-AJ992 defines operating restrictions for de-pairing certain engines before an IPT blade cyclic life. Revisions 1 and 2 of this NMSB differ by identifying different engine serial numbers that are affected by the respective NMSBs. RR SB Trent 1000 72-H818 introduces a new IPT blade less susceptible to shank corrosion and exempt from this AD. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

Other Related Service Information

We reviewed RR NMSB Trent 1000 72-J442, Revision 1, dated February 21, 2018; and initial issue, dated September 21, 2016; and RR NMSB Trent 1000 72-J465, Revision 2, dated February 28, 2018; Revision 1, dated January 10, 2017; and initial

issue, dated December 22, 2016. RR NMSBs Trent 1000 72-J442 and Trent 1000 72-J465 describe procedures for refurbishing an engine with either serviceable used or new IPT blades, and also the cleaning and inspection requirements for the reuse of IPT blades.

FAA's Determination

This product has been approved by EASA and is approved for operation in the United States. Pursuant to our bilateral agreement with the European Community, EASA has notified us of the unsafe condition described in the MCAI and service information referenced above. We are issuing this AD because we evaluated all relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

AD Requirements

This AD requires removal of one engine from an airplane before both engines exceed their respective IPT blade operating restrictions.

FAA's Justification and Determination of the Effective Date

No domestic operators are affected by this regulatory action. Therefore, we find good cause that notice and opportunity for prior public comment are unnecessary. In addition, for the reason stated above, we find that good cause exists for making this amendment effective in less than 30 days.

Comments Invited

This AD is a final rule that involves requirements affecting flight safety, and was not preceded by notice and an opportunity for public comment. However, we invite you to send any written data, views, or arguments about this final rule. Send your comments to an address listed under the ADDRESSES section. Include the docket number "Docket No. FAA-2017-1237 and Product Identifier "2017-NE-43-AD" at the beginning of your comments. We specifically invite comments on the overall regulatory, economic,

environmental, and energy aspects of this final rule. We will consider all comments received by the closing date and may amend this final rule because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this final rule.

Costs of Compliance

We estimate that this AD affects 0 engines installed on airplanes of U.S. registry.

We estimate the following costs to comply with this AD:

Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Time-Staggering of selected Trent 1000 engines on B787	48 work-hours X \$85 per hour = \$4,080	\$0	\$4,080	\$0

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA’s authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. “Subtitle VII: Aviation Programs,” describes in more detail the scope of the Agency’s authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: “General requirements.” Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority

because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to engines, propellers, and associated appliances to the Manager, Engine and Propeller Standards Branch, Policy and Innovation Division.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Is not a “significant rule” under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

2018-15-01 **Rolls-Royce plc:** Amendment 39-19333; Docket No. FAA-2017-1237;

Product Identifier 2017-NE-43-AD.

(a) Effective Date

This AD is effective [INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to Rolls-Royce plc (RR) Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H, Trent 1000-A2 Trent 1000-C2, Trent 1000-D2, Trent 1000-E2, Trent 1000-G2, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2, and Trent 1000-L2 engine models with engine serial numbers identified in Appendix 1, Table 1, of RR Alert Non-Modification Service Bulletin (NMSB) TRENT 1000 72-AJ992, Revision 1, dated January 3, 2018, or Appendix 1, Table 1, of RR Alert NMSB TRENT 1000 72-AJ992, Revision 2, dated April 16, 2018, except those that have incorporated RR Service Bulletin (SB) Trent 1000 72-H818, dated November 14, 2016.

(d) Subject

Joint Aircraft System Component (JASC) 7250, Turbine Engine, Turbine Section.

(e) Unsafe Condition

This AD was prompted by operating restrictions that have been defined for certain engines with intermediate-pressure turbine (IPT) blades susceptible to shank corrosion and possible blade separation. These restrictions define when an engine can no longer be installed on an airplane together with other engines susceptible to the same failure. We are issuing this AD to prevent the simultaneous failure of both engines. This unsafe condition, if not addressed, could result in a dual engine in-flight shutdown and loss of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

After the effective date of this AD, for any affected engine identified in Appendix 1, Table 1, of RR Alert NMSB TRENT 1000 72-AJ992, Revision 1, dated January 3, 2018; or Appendix 1, Table 1, of RR Alert NMSB TRENT 1000 72-AJ992, Revision 2, dated April 16, 2018, installed with another affected engine, listed in the same table, on the same airplane, remove one of the engines from the airplane before both engines exceed their respective IPT blade cyclic life limit identified in Appendix 1, Table 1, of the respective NMSB, or within 20 flight cycles, whichever occurs later.

(h) Installation Prohibition

(1) Engines listed in each group in Appendix 1, Table 1, of RR Alert NMSB Trent 1000 72-AJ992, Revision 1, dated January 3, 2018, or Appendix 1, Table 1, of Alert NMSB Trent 1000 72-AJ992, Revision 2, dated April 16, 2018, are not to be installed on an airplane together with an engine listed in a different group in the same table once they have exceeded their IPT blade cyclic life limit identified in Appendix 1, Table 1 of the respective NMSB.

(2) Engines listed in Appendix 1, Table 1, of RR Alert NMSB Trent 1000 72-AJ992, Revision 1, dated January 3, 2018, or Appendix 1, Table 1, of RR Alert NMSB Trent 1000 72-AJ992, Revision 2, dated April 16, 2018, may not be installed on an airplane with engines that have IPT blades installed in accordance with RR NMSB Trent 1000 72-J442, Revision 1, dated February 21, 2018, or Initial Issue, dated September 21, 2016; or RR NMSB Trent 1000 72-J465, Revision 2, dated February 28, 2018, or Revision 1, dated January 10, 2017, or Initial Issue, dated December 22, 2016.

(i) Terminating Action

Modification of an engine in accordance with the instructions of RR SB Trent 1000 72-H818, dated November 14, 2016, constitutes terminating action for the requirements of this AD for that engine.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (k)(1) of this AD. You may email your request to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(k) Related Information

(1) For more information about this AD, contact Kevin M. Clark, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7088; fax: 781-238-7199; email: kevin.m.clark@faa.gov.

(2) Refer to European Aviation Safety Agency (EASA) AD 2018-0086, dated April 17, 2018, for more information. You may examine the EASA AD in the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating it in Docket No. FAA-2017-1237.

(I) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Rolls-Royce plc (RR) Alert Non-Modification Service Bulletin (NMSB) Trent 1000-72-AJ992, Revision 1, dated January 3, 2018.

(ii) RR Alert NMSB Trent 1000-72-AJ992, Revision 2, dated April 16, 2018.

(iii) RR Service Bulletin Trent 1000 72-H818, dated November 14, 2016.

(3) For RR service information identified in this AD, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, England, DE24 8BJ; phone: 011-44-1332-242424; fax: 011-44-1332-249936; email: http://www.rolls-royce.com/contact/civil_team.jsp; Internet: <https://customers.rolls-royce.com/public/rollsroycecare>.

(4) You may view this service information at FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7759.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: <http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued in Burlington, Massachusetts, on July 17, 2018.

Robert J. Ganley,
Manager, Engine and Propeller Standards Branch,
Aircraft Certification Service.

[FR Doc. 2018-15649 Filed: 7/20/2018 8:45 am; Publication Date: 7/23/2018]